

REMARKS/ARGUMENTS

Claims 1 - 7, and 9 - 21, and 23 - 24 remain in the application. Claims 8, 22, and 25 - 34 have been cancelled.

Examiner Kennedy is thanked for carefully reviewing the subject patent application. All claims under consideration are now believed to be in allowable condition, and allowance is so requested.

I. The Amendments

Claim 1 was amended at line 7 to include the term "selective" before the "etch back step" to point out that the Applicants etch process is selective in that the insulation layer has a higher rate of removal than the cap layer. This additional description of the etch back step in the specification is supported by lines 20 - 21 on page 13.

Claim 11 was amended at line 9 to include the term "selective" before the "etch back step" to point out that the Applicants etch process is selective in that the insulation layer has a higher rate of removal than the cap layer. This additional description of the etch back step is supported by lines 20 - 21 on page 13.

II. Rejection under 35 U.S.C. 103 (a)

Reconsideration of the rejection of claims 1 - 24 under 35 USC 103 (a) as being unpatentable over Applicants admitted prior art (AAPA) in view of Huang et al. (U.S. Patent 5,747,382) and Park (U.S. Patent 6,025,223) is requested, in light of the following.

The Applicants respectfully submit that AAPA does not teach a method of “performing a CMP step to planarize said insulation layer wherein the planarized insulation layer has a certain thickness above said cap layer”. In fact, the Applicants prior art in FIG. 4 and on page 4, lines 6 - 22, clearly shows and describes a CMP step that contacts the cap layer and wherein the polished insulation layer has a certain thickness below the cap layer. The applicants teach against the CMP process depicted in FIG. 4 because of the disadvantages of causing significant cap layer thickness loss and an uneven surface on the insulation layer with a protrusion distance “d”.

With regard to the Examiner’s statement in the second paragraph on page 5 of the office communication, the selective etch back process in amended claim 1 is clearly distinguished from Huang’s method since Huang’s etch is not selective. Huang teaches an etch process that removes the top portion of a dielectric layer. The etch does not come in contact with a second layer such as a cap layer and therefore cannot be “selective”.

With regard to the Examiner’s statement in the fourth paragraph on page 5 of the office communication that “Park discloses the method wherein the insulating layer is planarized at a certain distance below said cap layer”, the Applicants respectfully submit that insulating layer 36 and insulating spacer 36a are not planar. Those skilled in the art will recognize that Park’s insulation layer 36 is not planar since it is well known that depositing an insulating layer on topography such as adjacent capacitor cells having an opening therebetween does not result in a smooth top surface. In particular, the top surface of the insulating layer would be at a higher level directly above the capacitor cells

than over a region which lies between two adjacent capacitor cells. Furthermore, the insulating spacer 36a would not be planar because the thickness of the insulating spacer would be greater in a region adjacent to a capacitor cell than in a region about midway between adjacent capacitor cells. Indeed, Park does not mention a planarization process or a planarized insulating layer or insulating spacer. A key condition in the present invention which is a planarized insulation layer prior to the selective etch back step is not taught by Park. Therefore, the Applicants respectfully point out that the present invention is patentable over AAPA in view of Huang and Park.

With regard to claim 7 and in view of amended claim 1, the Applicants respectfully submit that Huang (col. 4, lines 1-10) does not teach a selective etch back process since only the IMD layer is etched in Huang's process and by definition two layers must be exposed to an etchant for the etch process to be selective.

Regarding the Examiner's comments in the second paragraph on page 7 of the office communication, the Applicants respectfully submit that the advantages of the claimed invention are stated on page 13, lines 21 - 23 and continuing on page 14, lines 1 to 3. In particular, the thickness variation after the etch back step is within ± 5 Angstroms compared to the prior art variation of ± 40 Angstroms. Furthermore, "The etch back planarization step results in a top surface 30 of the second insulation layer 27 that is more uniform than in prior art methods...." as stated on page 14, lines 20 - 22.

With respect to the Examiner's comments on pages 8 to 11 that relate to claims 11 to 24, the same arguments stated by the Applicants in the preceding paragraphs apply here as well. Claim 11 was amended similar to claim 1 to point out that the etch back step is selective. The independent claims 1 and 11 are believed to be patentable based on the arguments above. Therefore, the dependent claims which depend on the independent claims are also believed to be patentable.

The Applicants respectfully submit that none of the applied or known references address the claimed invention as described in claims 1 to 7, 8 to 21, and 23, 24 in which an insulation layer is first planarized by a CMP process that does not contact a capping layer in an MTJ element and is then selectively etched back to a planarized surface at a certain level below the capping layer. The claimed invention is believed to be patentable over the prior art cited, as it is respectfully suggested that the combination of the AAPA, Huang, and Park references does not teach a selective etch on a CMP planarized layer to produce a second planarized surface. Applicant has claimed his process in detail. The processes of FIGS. 5 - 11 (claims 1 - 7, 9-21, 23, 24) are believed to be novel and patentable over the applied references. We therefore request Examiner Kennedy to reconsider her objection in view of the aforementioned arguments and the amendments to claims 1 and 11.

All claims are now believed to be in condition for allowance, and allowance is so requested.

Application No. 10/849,311
Amendment dated March 30, 2005
Reply to Office communication of January 5, 2005

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'S.B. Ackerman', with a stylized flourish at the end.

Stephen B. Ackerman, Reg. No. 37,761